

Bothropoides neuwiedi (Wagler, 1824) (Squamata: Serpentes: Viperidae): Distribution extension for the Atlantic Forest, first vouchered record for Paraíba, and geographic distribution map

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ABSTRACT: Few records exist for *Bothropoides neuwiedi* in the northeast of Brazil. Herein, we report the first vouchered specimen for *B. neuwiedi* from Paraíba state, which represents the first record of the species in coastal Atlantic Forest of northeastern Brazil.

In a recent work on morphological and molecular phylogeny of South American pitvipers, the genus *Bothrops* was split into multiple genera (Fenwick *et al.* 2009). Within this new classification, *Bothrops* Wagler, 1824 is composed only of species of the *atrox*, *jararacussu* and *lanceolatus* groups. The genus *Rhinocerophis* Garman, 1881 comprises only species of the *alternatus* group, whereas the new genus *Bothropoides* Fenwick *et al.* 2009 contains 10 species of two recognized complexes, the *jararaca* group (that includes three species: *B. jararaca* (Wied, 1824), *B. insularis* (Amaral, 1922) and *B. alcatraz* (Marques, Martins and Sazima, 2002)) and the *neuwiedi* complex (*B. neuwiedi* (Wagler, 1824), *B. lutzi* (Miranda-Ribeiro, 1915), *B. pauloensis* (Amaral, 1925), *B. pubescens* (Cope, 1870), *B. diporus* (Cope, 1862), *B. matto grossensis* (Amaral, 1925), *B. marmoratus* (Silva and Rodrigues, 2008), and *B. erythromelas* (Amaral, 1923)).

All described species of *Bothropoides* occur in Brazil, and many of their ranges overlap to some extent (Silva and Rodrigues 2008). The two southernmost species are *B. diporus* and *B. pubescens* which occur from southern Brazil to Uruguay and Argentina (Silva and Rodrigues 2008). *B. pauloensis* and *B. marmoratus* are found in central Brazil, and *B. matto grossensis* ranges throughout open landscapes in Paraguay, Bolivia, Peru, and central Brazil with disjunct populations in Amazonian Savannas (França *et al.* 2006). *B. lutzi* occurs from east-central to northeastern Brazil (Loebmann 2009) and *B. erythromelas* is found in northeast Brazil in the Caatinga biome (Campbell and Lamar 2004). Finally, *B. neuwiedi* ranges from southern Brazil in Santa Catarina northeastward to Bahia, Ceará and Paraíba (Lira-da-Silva *et al.* 2009).

Bothropoides neuwiedi differs from the other northeastern *Bothropoides* by having 22-29 midbody dorsal scale rows, 158-185 ventrals, and 39-56 subcaudals

(*B. erythromelas* has 19-21 midbody dorsal scale rows, 139-158 ventrals, and 32-42 subcaudals), dorsal scales with keels identical in coloration with the ground color, dorsolateral blotches with well-defined borders, and dark supralabials with large, round white blotches. *B. lutzi* has white keels on some dorsal scales, blotches with ill-defined borders, and supralabials with small white blotches.

On 18 June 2011, we collected a specimen of *Bothropoides neuwiedi* (Figure 1) in the city of Rio Tinto, PB. The individual was inactive in a disturbed forest patch at 09:30 h (06°48'513" S, 35°04'313" W) (Figure 2). Despite the snake being recorded in a disturbed area, the city is close to one of the most important reserves of northeast Atlantic forest, the Reserva Biológica Guaribas. This 4028-ha patch is part of the 2% of the original Atlantic forest remaining in northeast Brazil (Silva and Tabarelli 2000), and includes several fauna and flora species



FIGURE 1. *Bothropoides neuwiedi* from the municipality of Rio Tinto, PB, Brazil (Photo by FGFRF).

characteristic of the region. In addition, this reserve exhibits two different vegetation formations (Salgado *et al.* 1981): semi-deciduous rainforest (primary and secondary formation) and open savanna woodland called tabuleiros (Oliveira-Filho and Carvalho 1993).

The snake specimen reported here matches the description of *B. neuwiedi* given by Silva (2004) and Silva and Rodrigues (2008): male, with 16 dark brown white-edged dorsolateral blotches, seven keeled intersupraoculars, eight supralabials, two small scales between the subocular and fourth supralabial, nine infralabials, 25 midbody dorsal scale rows, 190 ventrals, and 68 divided subcaudals. The specimen was collected (collection permits SISBIO 22940-2) and deposited in Coleção Herpetológica da Universidade Federal da Paraíba (CHUFPB, voucher number RT400).

Despite there being previous records of envenomation by *Bothropoides neuwiedi* for Paraíba state (Lira-da-Silva *et al.* 2009; Oliveira *et al.* 2010), these works do not mention the municipality where the cases occurred. Interviews with a local researcher revealed that these envenomation cases were from Pitimbu and Guarabira municipalities in

the south coast, and in Agreste of Paraíba respectively (Dr. Helder Neves de Albuquerque, personal communication); however, there were no voucher specimens. Herein we present the first voucher specimen of *Bothropoides neuwiedi* for Paraíba state and the first record for the Atlantic Forest biome in the northern coast of Paraíba (Figure 3). In addition, this represents the northernmost record for the species.



FIGURE 2. Disturbed area where the specimen of *Bothropoides neuwiedi* was found. Rio Tinto, PB. (Photo by CESG).

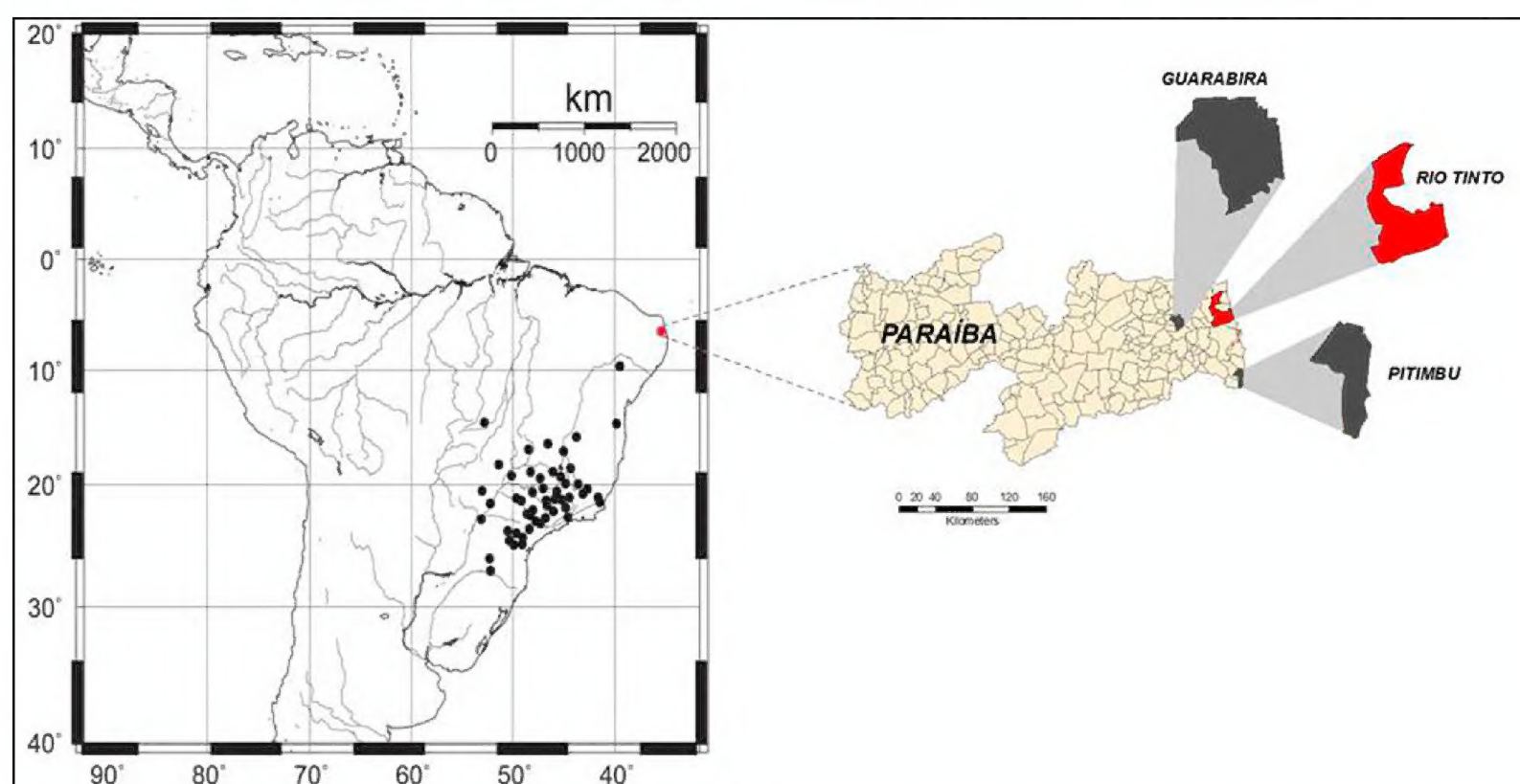


FIGURE 3. Geographic distribution of *Bothropoides neuwiedi*. Black circles represent the species distribution according to Silva and Rodrigues (2008). The red symbol represents the occurrence in Rio Tinto, and areas of accident occurrence in Guarabira and Pitimbu, PB.

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LITERATURE CITED

- Campbell, J.A. and W.W. Lamar. 2004. *The Venomous Reptiles of the Western Hemisphere*. Ithaca. Cornell University Press. 870 p.
- Fenwick, A.M., R.L. Gutberlet, J.A. Evans and C.L. Parkinson. 2009. Morphological and molecular evidence for phylogeny and classification of South American pitvipers, genera *Bothrops*, *Bothriopsis*, and *Bothrocophias* (Serpentes: Viperidae). *Zoological Journal of the Linnean Society* 156: 617-640.
- França, F.G.R., D.O. Mesquita and G.R. Colli. 2006. A checklist of snakes from amazonian savannas in Brazil, housed in the Coleção Herpetologica da Universidade de Brasília, with new distribution records. *Occasional Papers Sam Noble Oklahoma Museum Of Natural History* 17: 1-13.
- Lira-da-Silva, R.M., Y.F. Mise, L.L. Casais-e-Silva, J. Ulloa, B. Handam and T.K. Brazil. 2009. Serpentes de importância médica do nordeste do Brasil. *Gazeta Médica da Bahia* 79: 7-20.
- Loebmann, D. 2009. Reptilia, Squamata, Serpentes, Viperidae, *Bothrops lutzi*: distribution extension. *Check List* 5(3): 375-377.

- Oliveira F.N., M.T. Brito, I.C.O. Morais, S.M.L. Fook and H.N. Albuquerque. 2010. Accidents caused by *Bothrops* and *Bothropoides* in the State of Paraíba: epidemiological and clinical aspects. *Revista da Sociedade Brasileira de Medicina Tropical* 43(6): 662-667.
- Oliveira-Filho, A.T. and D.A. Carvalho. 1993. Florística e fisionomia da vegetação no extremo norte do litoral da Paraíba. *Revista Brasileira de Botânica* 16: 115-130.
- Salgado, O.A., S.J. Filho and L.M.C. Gonçalves. 1981. As regiões fitoecológicas, sua natureza e seus recursos econômicos. Estudo fitogeográfico; p. 485-544 In *Projeto RADAMBRASIL, Levantamento de Recursos Naturais, vol. 23, Folhas SB 24/25, Jaguaribe / Natal*. Rio de Janeiro: Ministério das Minas e Energia. 744 p.
- Silva, J.M.C. and M. Tabarelli. 2000. Tree species impoverishment and the future flora of the Atlantic forest of northeast Brazil. *Nature* 404: 72-74.
- Silva, V.X. 2004. The *Bothrops neuwiedi* complex; p. 410-422 In J.A. Campbell and W.W. Lamar (ed.), *The Venomous Reptiles of the Western Hemisphere*. Ithaca. Cornell University Press.
- Silva, V.X. and M. T. Rodrigues. 2008. Taxonomic revision of the *Bothrops neuwiedi* complex (Serpentes, Viperidae) with description of a new species. *Phyllomedusa* 7(1): 45-90.

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